
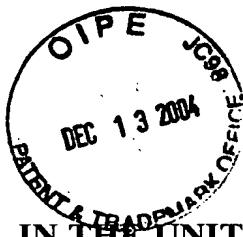


SPWAFS

TRANSMITTAL OF APPEAL BRIEF (Large Entity)					Docket No. SEC.912			
In Re Application Of: Kyoung-Yoon BAEK et al.								
Application No. 10/043,329	Filing Date 14 January 2002	Examiner Shrinivas H. RAO	Customer No.	Group Art Unit 2814	Confirmation No. 6682			
Invention: OVERLAY KEY, METHOD OF MANUFACTURING THE SAME AND METHOD OF MEASURING AN OVERLAY DEGREE USING THE SAME								
<u>COMMISSIONER FOR PATENTS:</u> Transmitted herewith in triplicate is the Appeal Brief in this application, with respect to the Notice of Appeal filed on 13 October 2004 The fee for filing this Appeal Brief is: \$500.00 <input checked="" type="checkbox"/> A check in the amount of the fee is enclosed. <input type="checkbox"/> The Director has already been authorized to charge fees in this application to a Deposit Account. <input checked="" type="checkbox"/> The Director is hereby authorized to charge any fees which may be required, or credit any overpayment to Deposit Account No. 50-0238 <input type="checkbox"/> Payment by credit card. Form PTO-2038 is attached. WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.								
 _____ <i>Signature</i> KENNETH D. SPRINGER REG. NO.: 39,843 VOLENTINE FRANCOS & WHITT, PLLC ONE FREEDOM SQUARE 11951 FREEDOM DRIVE, SUITE 1260 RESTON, VA 20190 TEL. NO.: (703) 715-0870			Dated: 13 December 2004 <table border="1" style="width: 100%; border-collapse: collapse;"><tr><td style="padding: 5px;">I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to "Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450" [37 CFR 1.8(a)] on _____ (Date)</td></tr><tr><td style="padding: 5px;">_____ Signature of Person Mailing Correspondence</td></tr><tr><td style="padding: 5px;">_____ Typed or Printed Name of Person Mailing Correspondence</td></tr></table>			I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to "Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450" [37 CFR 1.8(a)] on _____ (Date)	_____ Signature of Person Mailing Correspondence	_____ Typed or Printed Name of Person Mailing Correspondence
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Serial No. 10/043,329
SEC.912
Appeal Brief dated 13 December 2004

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent application of :
Kyoung-Yoon BAEK et al. : Group Art Unit: 2814
Serial No. 10/043,329 : Examiner: Shrinivas H. RAO
Filed: 14 January 2002 :

OVERLAY KEY, METHOD OF
MANUFACTURING THE SAME
AND METHOD OF MEASURING
AN OVERLAY DEGREE USING
THE SAME

APPEAL BRIEF

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Sir:

In response to the Office Action dated 28 July 2004, twice rejecting pending claims 1-23 and 51-58, and in support of the Notice of Appeal filed on 13 October 2004, Applicants hereby submit this Appeal Brief.

Real Parties in Interest

Samsung Electronics Co, Ltd. owns all of the rights in the above-identified U.S. patent application by virtual of an assignment recorded at Reel 012482, Frame 0769.

Related Appeals and Interferences

There are no other appeals or interferences related to this application or to any related application, nor will the disposition of this case affect, or be affected by, any other application directly or indirectly.

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Status of Claims

Claims 1-23 (Pending).

Claims 24-50 (Canceled).

Claims 51-58 (Pending).

Claims 1-23 and 51-58 have all been twice rejected. Accordingly, the claims on Appeal are 1-23 and 51-58.

Status of Amendments

There are no pending amendments with respect to this application.

Summary of Claimed Subject Matter

The present invention is directed to an overlay key for use in a semiconductor device.

Accordingly, the invention, as broadly recited in independent claim 1, comprises a first overlay key (e.g., page 9, lines 6-7 and element 20 in FIGs. 3A and 3C) having a first main overlay pattern (e.g., page 9, lines 9-10 and element 300 in FIG. 3A) and a first auxiliary overlay pattern (e.g., page 9, lines 9-10 and element 310 in FIG. 3A); and a second overlay key (e.g., page 9, lines 6-7 and element 25 in FIGs. 3B and 3C) having a second main overlay pattern (e.g., page 9, lines 10-11 and element 320 in FIG. 3B) and a second auxiliary overlay pattern (e.g., page 9, lines 10-11 and element 330 in FIG. 3B), the second auxiliary overlay pattern being formed at a location corresponding to the first auxiliary overlay pattern (e.g., page 9, lines 18-19 and FIG. 3C).

Meanwhile, as broadly recited in independent claim 51, the invention comprises a first overlay key (e.g., page 9, lines 6-7 and element 20 in FIGs. 3A and 3C) on a first layer (e.g., page 11, lines 14-17 and FIG. 5B) having a first main overlay pattern (e.g., page 9, lines 9-10 and element 300 in FIG. 3A) and a first auxiliary overlay pattern (e.g., page 9, lines 9-10 and element 310 in FIG. 3A); and a second overlay key (e.g., page 9, lines 6-7 and element 25 in FIGs. 3B and 3C) on a

second layer above the first layer (e.g., page 12, lines 2-8 and FIG. 5D), having a second main overlay pattern (e.g., page 9, lines 10-11 and element 320 in FIG. 3B) and a second auxiliary overlay pattern (e.g., page 9, lines 10-11 and element 330 in FIG. 3B), wherein, when viewed from above, at least some portion of the second auxiliary overlay pattern directly overlies at least some portion of the first auxiliary overlay pattern (e.g., page 11, lines 6-10 and FIGs. 4C and 5D).

As broadly recited in claims 3, 13, 17 and 20, the invention further features the first auxiliary overlay pattern being formed at a corner portion of the first overlay key (e.g., page 9, lines 15-16 and FIG. 3A).

As broadly recited in claims 4, 14, and 18 the invention further features the length of the first main overlay pattern being equal to a length of a corresponding side of the second main overlay pattern (e.g., page 9, lines 16-18 and FIG. 3C).

As broadly recited in claims 5, 15, 19 and 22, the invention further features the first main overlay pattern being defined by imaginary lines extended from two parallel outside lines of the second main overlay pattern (e.g., page 9, lines 12-15 and FIG. 3C).

As broadly recited in claims 6 and 52, the invention further features the first auxiliary overlay pattern including a plurality of bar patterns spaced apart from each other (e.g., page 9, lines 12-15 and FIG. 3C).

As broadly recited in claims 8 and 54, the invention further features an interval between two adjacent bar patterns in the first auxiliary overlay pattern being larger than a width of a hole pattern in a second auxiliary overlay pattern (e.g., page 6, lines 18-19 and FIG. 4C).

As broadly recited in claims 9 and 55, the invention further features the second auxiliary overlay pattern including a plurality of second bar patterns having a smaller width than the bar patterns of the first auxiliary overlay pattern (e.g., page 14, lines 3-4 and FIGs. 7A-C).

As broadly recited in claims 10 and 56, the invention further features the first auxiliary overlay pattern including a plurality of hole patterns (e.g., page 14, lines 18-19 and FIG. 9A).

As broadly recited in claims 11 and 57, the invention further features the second auxiliary overlay pattern including a plurality of bar patterns (e.g., page 14, lines 20-21 and FIG. 9B).

As broadly recited in claims 12 and 58, the invention further features a width of the hole pattern of the first auxiliary overlay pattern being larger than a width of the bar pattern of the second auxiliary overlay pattern (e.g., page 15, lines 4-6 and FIG. 9C).

Grounds of Rejection to be Reviewed on Appeal

The issues on Appeal are:

- (1) The rejection of claims 1-3, 6, 13, 16-17, 20 and 22 over Baluswamy et al. U.S. Patent 6,514,643 ("Baluswamy") under 35 U.S.C. § 102;
- (2) The rejection of claims 4-5, 7-12, 14-15, 18-19, 21, 23 and 51-58 under 35 U.S.C. § 103 over Baluswamy in view of Smith et al. U.S. Patent 6,573,986 ("Smith").¹

Arguments

Claims 1-3, 6, 13, 16-17, 20 and 22 Are All Patentable Over Baluswamy

The Examiner rejected claims 1-3, 6, 13, 16-17, 20 and 22 under 35 U.S.C. § 102 as allegedly being unpatentable over Baluswamy et al. U.S. Patent 6,514,643 ("Baluswamy").

Applicants respectfully traverse those rejections and submit that claims 1-3, 6, 13, 16-17, 20 and 22 are all patentable over Baluswamy for at least the following reasons.

Claim 1

¹ The Final Office Action fails to state any grounds whatsoever for the rejection of claims 51-58. On 12 October 2004 the undersigned attorney contacted the Examiner, requesting an explanation for the basis upon which he rejected claims 51-58. In the Examiner's "Interview Summary" dated 13 October 2004, the Examiner states that "claim 51 is rejected for same reasons as claims 1, 4 and 5 (103 rejection), claims 52-58 (for same reasons as 6-12 respectively, and all claims 52 to 58 are rejected under 103)". Of course, contrary to this statement, claim 1 was actually rejected under 102, not 103. However, claims 4 and 5 were rejected under 103. Accordingly, Applicants have interpreted the mention of claim 1 as a typographical error, and understand that all of the claims 51-58 are rejected under 35 USC § 103 over Baluswamy in view of Smith.

Among other things, the overlay key of claim 1 includes a second auxiliary overlay pattern **formed at a location corresponding to a first auxiliary overlay pattern**. Accordingly, as explained in Applicant's specification with respect to an exemplary embodiment shown in FIGs. 3A-C, for example the first and second auxiliary overlay patterns may be used to measure, with an in-line scanning electron microscope (SEM), an overlay degree between the first and second overlay keys.

Applicants respectfully submit that Baluswamy does not disclose an overlay key that includes such a feature.

The Office Action states that the element 240 in FIG. 5 of Baluswamy corresponds to a second auxiliary overlay pattern and that element 220 corresponds to a first auxiliary overlay pattern. However, Applicants respectfully submit that element 240 in FIG. 5 of Baluswamy is **not** **"formed at a location corresponding to"** element 220. The element 240 is formed at a different location, laterally isolated with respect to the location of element 220. Therefore, the overlay key shown in FIG. 5 of Baluswamy cannot correspond to the overlay key of claim 1.

M.P.E.P. § 2131 provides that "TO ANTICIPATE A CLAIM, THE REFERENCE MUST TEACH EVERY ELEMENT OF THE CLAIM" (see also Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987)).

Clearly, Baluswamy does not disclose any overlay key where a second auxiliary overlay pattern is formed at a location corresponding to a first auxiliary overlay pattern. Accordingly, it is not possible for Baluswamy to anticipate claim 1.

The Examiner makes much of the statement in the specification that the invention **"ALSO** provides an overlay key including a first overlay key including a first main overlay pattern and a first auxiliary overlay pattern, and a second overlay key including a second main overlay pattern and a second auxiliary overlay pattern, wherein the first and second auxiliary overlay patterns are formed at a location where the first and second main overlay patterns do not correspond to each other" (emphasis added).

However, none of the pending claims pertain to this alternative species, nor have any of the claims 1-23 or 51-58 ever devices encompassed such a feature. Claim 24 pertained devices including such a feature, but that claim has been canceled. And of course there is no requirement that every claim cover every structure disclosed in the specification.

Furthermore, the prohibition reading plainly recited features out of a claim is both longstanding and extremely well-established. See, e.g., Oak Technology, Inc. v. U.S. Int'l Trade Comm'n, 248 f.3d 1316, 1329, 58 USPQ2d 1748 (Fed. Cir. 2001); Ethicon EndoSurgery, Inc. v. United States Surgical Corp., 93 F.3d 1572, 1582-83, 40 USPQ2d 1019, 1027 (Fed. Cir. 1996).

Accordingly, for at least these reason, Applicants respectfully submit that claim 1 is patentable over Baluswamy.

Claims 2-3, 6, 13, 16-17, 20 and 22

Claims 2-3, 6, 13, 16-17, 20 and 22 all depend from claim 1 and are deemed patentable for at least the reasons set forth above with respect to claim 1, and for the following additional reasons.

Claims 3, 13, 17 and 20

Among other thing, in the overlay keys of claims 3, 13, 17 and 20, the first auxiliary overlay pattern is formed at a corner portion of the first overlay key.

Applicants respectfully submit that no such feature is disclosed in Baluswamy.

The Office Action states that "Baluswamy fig. 5 220 formed in corner of 210."

Even assuming *arguendo* that this was true (and from inspection of FIG. 5, it does not appear to be true), that is not what is claimed. The Examiner has stated that 210 corresponds to the recited first main overlay pattern, not the overlay key! Claims 3, 13, 17, and 20 do not recite that the first auxiliary overlay pattern is formed at a corner portion of the first main overlay pattern. Instead, they recite that the first auxiliary overlay pattern is formed at a corner portion of the first overlay key (which includes BOTH main and auxiliary overlay patterns). Inspection of FIGs. 5, and particularly 6, of Baluswamy reveals that element 220 is clearly not formed at a corner portion of any first overlay key.

Accordingly, for at least these additional reasons, Applicants respectfully submit that claims 3, 13, 17 and 20 are patentable over Baluswamy.

Claim 6

Among other things, in the overlay key of claim 6 the first auxiliary overlay pattern includes a plurality of bar patterns spaced apart from each other.

Applicants respectfully submit that no such feature is disclosed in Baluswamy.

The Examiner states that such a feature is shown in Baluswamy, fig. 5 as element 220.

Applicants believe that it will be clear to the Board of Patent Appeals from inspection of FIGs. 5 and 6 of Baluswamy that element 220 is a continuous rectangular ring and does not comprise any plurality of bar patterns spaced apart from each other. No further comment or explanation is even deemed necessary.

Accordingly, for at least these additional reasons, Applicants respectfully submit that claim 6 is patentable over Baluswamy.

Claim 22

At the outset, claim 22 depends from claim 21, and indirectly from claims 20 and 16. Applicants fail to understand how the Examiner can reject claim 21 under 35 U.S.C. § 102 when he has not rejected any of the underlying claims 16, 20 or 21 under 35 U.S.C. § 102.

Nevertheless, among other things, in the overlay key of claim 22, the first main overlay pattern is defined by imaginary lines extended from two parallel outside lines of the second main overlay pattern.

Applicants respectfully submit that no such feature is disclosed in Baluswamy.

The Examiner states that such a feature is shown by “baluswamy fig.5 210 parallel to 230.”

Once again, that is not what is claimed. More particularly, and very clearly, defined by imaginary lines extended from two parallel outside lines of element 230. Therefore, Baluswamy does not disclose the overlay key that is actually claimed in claim 22.

Accordingly, for at least these additional reasons, Applicants respectfully submit that claim 22 is patentable over Baluswamy.

**Claims 4, 5, 7-12, 14-15, 18-19, 21, 23 and 51-58 Are All Patentable Over
Baluswamy in view of Smith**

The Examiner rejected 4-5, 7-12, 14-15, 18-19, 21, 23 and 51-58 under 35 U.S.C. § 103 as allegedly being unpatentable over Baluswamy in view of Smith et al. U.S. Patent 6,573,986 ("Smith").

Applicants respectfully traverse those rejections and submit that claims 4-5, 7-12, 14-15, 18-19, 21, 23 and 51-58 are all patentable over any proper combination of Baluswamy and Smith for at least the following reasons.

Claims 4, 5, 7-12, 14-15, 18-19, 21 and 23

Applicants note that claims 4, 5, 7-12, 14-15, 18-19, 21 and 23 all depend from claim 1. Applicants respectfully submit that Smith fails to remedy the shortcomings of Baluswamy with respect to claim 1 and therefore no possible combination of Baluswamy and Smith could ever produce the overlay keys of claims 4, 5, 7-12, 14-15, 18-19, 21 and 23.

At the outset, Applicants respectfully traverse the proposed combination of Baluswamy and Smith with respect to each of the claims 4-5, 7-12, 14-15, 18-19, 21 and 23 as lacking any suggestion or motivation in the prior art.

Smith is directed to an apparatus and method for creating a projection lens distortion map.

For each and every one of the numerous features of claims 4-5, 7-12, 14-15, 18-19, 21 and 23 that are missing from Baluswamy's overlay key, the Office Action proposes to add-in features from Smith citing the same language in col. 6, lines 20-35 of Smith in all cases as supposedly providing the motivation to combine the references.

However, the supposed "benefits" cited in col. 6, lines 20-35 from Smith have absolutely nothing whatsoever to do with any overlay key, would not in any way apply to Baluswamy, and have no relationship whatsoever to any of the various features that the Office Action lifts from Smith and attempts to import into

Baluswamy. Smith teaches that the supposed “benefits” mentioned in col. 6, lines 20-35 accrue from application of the specific technique disclosed by Smith of creating a projection lens distortion error map (see, e.g., col. 5t, lines 24-25; Abstract, etc.), and not from use of any of the particular reticles or alignment marks shown by Smith.

For example, looking at claims 4, 14 and 18, the Examiner states that FIG. 1 of Smith shows the claimed feature that “a length of the first main overlay pattern equal to a length of a corresponding side of the second main overlay pattern.” However, Smith clearly teaches that the supposed “benefits” mentioned by in col. 6, lines 20-35 derive from application of the specific technique disclosed by Smith of creating a projection lens distortion error map, not from anything to do with any alignment marks shown in FIG. 1! Therefore, the cited text at col. 6, lines 20-35 of Smith provides absolutely no motivation whatsoever for one to modify the overlay key of Baluswamy to make “a length of the first main overlay pattern equal to a length of a corresponding side of the second main overlay pattern” as such a modification of Baluswamy would not provide any of the benefits cited in col. 6, lines 20-35 of Smith!

This is similarly true of all of the proposed combinations proposed by the Examiner in his rejections of claims 5, 7-12, 14-15, 18-19, 21 and 23.

Therefore, Applicants respectfully traverse the proposed combinations of Baluswamy and Smith and submit that all claim rejections based upon these combinations are improper as lacking any proper motivation in the prior art.

Accordingly, Applicants respectfully submit that claims 4-5, 7-12, 14-15, 18-19, 21 and 23 are all patentable over the cited art for at least the foregoing reasons, and for the following additional reasons.

Claims 4 and 14

Among other things, in the overlay keys of claims 4 and 14 a length of the first main overlay pattern is equal to a length of a corresponding side of the second main overlay pattern.

Applicants respectfully submit that no such feature is disclosed in Baluswamy or Smith.

The Examiner states that such a feature is shown by FIG. 1 of Smith.² Indeed, the Examiner stated: “Smith . . . describes in figure 1 a plurality of box marks having a length of the first main overlay pattern is equal to a length of a corresponding side of the second main overlay pattern”

Applicants respectfully disagree.

At the outset, FIG. 1 of Smith, cited throughout the Office Action, does not show any overlay keys at all, but instead shows a reticle schematic which is (only) one component of a system that may be used to form an overlay key. The patterns on the reticle 102 are not the same as an overlay key that may be actually formed using the patterns (see FIG. 21 which actually shows an overlay pattern that may be produced using the reticle of FIG. 1). So, FIG. 1 of Smith does not show any first and second main overlay patterns at all. Therefore, it is impossible for FIG.1 of Smith to show any overlay key where a length of a first main overlay pattern is equal to a length of a corresponding side of a second main overlay pattern.

Meanwhile, FIG, 14 of Smith **does** show several different overlay keys, but it does not appear that in any of those patterns, a length of the first main overlay pattern is equal to a length of a corresponding side of the second main overlay pattern. In particular, Applicants respectfully traverse the statement in the office Action that such a feature is shown in the multi-segmented frame-in-frame pattern of FIG. 14. In particular, Applicants respectfully submit that the multi-segmented frame-in-frame pattern of FIG. 14 of Smith does not disclose a feature wherein a length of a first main overlay pattern is equal to a length of a corresponding side of a second main overlay pattern.

Accordingly, for at least these additional reasons, Applicants respectfully submit that claim 4 is patentable over the cited prior art.

² In response to these same statements by Applicants in their Amendment dated 29 April 2004, the Examiner stated that “Applicants’ contention with regard to claim 4 is based on confused understanding of the outstanding rejection.” However, oddly and unfortunately, the Examiner failed to provide any further clarification, explanation, or elaboration of “the outstanding rejection.” Accordingly, Applicants stand by their statements and reiterate them here.

Claims 5, 15 and 19

Among other things, in the overlay keys of claims 5, 15 and 19, the first main overlay pattern is defined by imaginary lines extended from two parallel outside lines of the second main overlay pattern.

Applicants respectfully submit that no such feature is disclosed in Baluswamy or Smith.

The Examiner states that such a feature is shown by “baluswamy fig.5 210 parallel to 230.”

Once again, that is not what is claimed. More particularly, and very clearly, defined by imaginary lines extended from two parallel outside lines of element 230. Therefore, no combination of Baluswamy and Smith would ever produce any of the overlay keys that are actually claimed in claims 5, 15, or 19.

Accordingly, for at least these additional reasons, Applicants respectfully submit that claims 5, 15 and 19 are all patentable over the prior art.

Claims 8 and 54

Among other things, in the overlay keys of claims 8 and 54, an interval between two adjacent bar patterns in the first auxiliary overlay pattern is larger than a width of a hole pattern in a second auxiliary overlay pattern

Applicants respectfully submit that no such feature is disclosed in Baluswamy or Smith.

The Examiner states that such a feature is shown in “Smith figure 1.”

Applicants respectfully disagree.

At the outset, as explained previously, FIG. 1 of Smith does not show any overlay patterns at all, but only shows reticle schematic which is (only) one component of a system that may be used to form an overlay key. The patterns on the reticle 102 are not the same as an overlay key that may be actually formed using the patterns (see FIG. 21 which actually shows an overlay pattern that may be produced using the reticle of FIG. 1).

Furthermore, Applicants don’t even see anything in “Smith figure 1” even remotely resembling “two adjacent bar patterns in the first auxiliary overlay pattern.”

Frankly, Fig. 1 of Smith is not even very close to what is recited in claims 8 and 54.

Accordingly, for at least these additional reasons, Applicants respectfully submit that claims 8 and 54 are patentable over the prior art.

Claims 9 and 55

Among other things, in the overlay keys of claims 9 and 55, the second auxiliary overlay pattern including a plurality of second bar patterns having a smaller width than the bar patterns of the first auxiliary overlay pattern.

Applicants respectfully submit that no such feature is disclosed in Baluswamy or Smith.

The Examiner states that such a feature is shown by “Smith fig.1 big box b and small box A.”

Applicants respectfully disagree.

At the outset, as explained previously, FIG. 1 of Smith does not show any overlay patterns at all, but only shows reticle schematic which is (only) one component of a system that may be used to form an overlay key. The patterns on the reticle 102 are not the same as an overlay key that may be actually formed using the patterns (see FIG. 21 which actually shows an overlay pattern that may be produced using the reticle of FIG. 1).

Furthermore, Applicants believe that it will be clear to the Board of Patent Appeals that the various boxes shown in Smith’s FIG.1 are not a plurality of second bar patterns having a smaller width than bar patterns of a first auxiliary overlay pattern. No further comment or explanation is even deemed necessary.

Accordingly, for at least these additional reasons, Applicants respectfully submit that claims 9 and 55 are patentable over the prior art.

Claim 10 and 56

Among other things, in the overlay keys of claims 10 and 56, the first auxiliary overlay pattern includes a plurality of hole patterns.

Applicants respectfully submit that no such feature is disclosed in Baluswamy or Smith.

The Examiner states that such a feature is shown by “Smith figure 3.”

Applicants respectfully disagree.

At the outset, FIG. 3 of Smith does not show any overlay patterns at all, but only shows reticle schematic which is (only) one component of a system that may be used to form an overlay key. The patterns on the reticle 300 are not the same as an overlay key that may be actually formed using the patterns.

Furthermore, Applicants believe that it will be clear to the Board of Patent Appeals that Smith’s FIG.3 does not a plurality of hole patterns. No further comment or explanation is even deemed necessary.

Accordingly, for at least these additional reasons, Applicants respectfully submit that claims 10 and 56 are patentable over the prior art.

Claims 11 and 57

Among other things, in the overlay keys of claims 11 and 57 the second auxiliary overlay pattern includes a plurality of bar patterns spaced apart from each other.

Applicants respectfully submit that no such feature is disclosed in Baluswamy or Smith.

The Examiner states that such a feature is shown in Baluswamy, fig. 5 as element 220.

Applicants believe that it will be clear to the Board of Patent Appeals from inspection of FIGs. 5 and 6 of Baluswamy that element 220 is a continuous rectangular ring and does not comprise any plurality of bar patterns spaced apart from each other. No further comment or explanation is even deemed necessary.

Accordingly, for at least these additional reasons, Applicants respectfully submit that claims 11 and 57 are patentable over the prior art.

Claims 12 and 58

Among other things, in the overlay keys of claims 12 and 58 features a width of the hole pattern of the first auxiliary overlay pattern being larger than a width of the bar pattern of the second auxiliary overlay pattern

Applicants respectfully submit that no such feature is disclosed in Baluswamy or Smith..

The Examiner states that such a feature is shown in Baluswamy, figure 20.

Applicants believe that it will be clear to the Board of Patent Appeals that FIG. 20 of Baluswamy does not disclose any such feature.

Accordingly, for at least these additional reasons, Applicants respectfully submit that claims 12 and 58 are patentable over the prior art.

CONCLUSION


Fr all of the foregoing reasons, Applicants respectfully submits that claims 1-23 and 51-58 are all patentable over the cited prior art. Therefore, Applicants respectfully request that claims 1-23 and 51-58 be allowed and the application be passed to issue.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 50-0238 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17, particularly extension of time fees.

Respectfully submitted,

VOLENTINE FRANCOS & WHITT, P.L.L.C.

Date: 13 December 2004

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Appendix - Claims on Appeal

1. (Original) An overlay key, comprising:
a first overlay key having a first main overlay pattern and a first auxiliary overlay pattern; and
a second overlay key having a second main overlay pattern and a second auxiliary overlay pattern, the second auxiliary overlay pattern being formed at a location corresponding to the first auxiliary overlay pattern.
2. (Original) The overlay key of claim 1, wherein the first and second overlay keys have a frame shape.
3. (Original) The overlay key of claim 2, wherein the first auxiliary overlay pattern is formed at a corner portion of the first overlay key.
4. (Original) The overlay key of claim 3, wherein a length of the first main overlay pattern is equal to a length of a corresponding side of the second main overlay pattern.
5. (Original) The overlay key of claim 4, wherein the first main overlay pattern is defined by imaginary lines extended from two parallel outside lines of the second main overlay pattern.
6. (Original) The overlay key of claim 1, wherein the first auxiliary overlay pattern includes a plurality of bar patterns spaced apart from each other.
7. (Original) The overlay key of claim 6, wherein the second auxiliary overlay pattern includes a plurality of hole patterns spaced apart from each other.

8. (Original) The overlay key of claim 7, wherein an interval between two adjacent bar patterns is larger than a width of the hole pattern.

9. (Original) The overlay key of claim 6, wherein the second auxiliary overlay pattern includes a plurality of second bar patterns having a smaller width than the bar patterns.

10. (Original) The overlay key of claim 1, wherein the first auxiliary overlay pattern includes a plurality of hole patterns.

11. (Original) The overlay key of claim 10, wherein the second auxiliary overlay pattern includes a plurality of bar patterns.

12. (Original) The overlay key of claim 11, wherein a width of the hole pattern of the first auxiliary overlay pattern is larger than a width of the bar pattern of the second auxiliary overlay pattern.

13. (Original) The overlay key of claim 2, wherein the first auxiliary overlay pattern is formed at a location adjacent to a corner portion of the first overlay key.

14. (Original) The overlay key of claim 13, wherein a length of the first main overlay pattern is equal to a length of a corresponding side of the second main overlay pattern.

15. (Original) The overlay key of claim 14, wherein the first main overlay pattern is defined by imaginary lines extended from two parallel outside lines of the second main overlay pattern.

16. (Original) The overlay key of claim 1, wherein the first and second overlay keys have a substantially rectangular shape.

17. (Original) The overlay key of claim 16, wherein the first auxiliary overlay pattern is formed on a corner portion of the first overlay key.

18. (Original) The overlay key of claim 17, wherein a length of the first main overlay pattern is equal to a length of a corresponding side of the second main overlay pattern.

19. (Original) The overlay key of claim 18, wherein the first main overlay pattern is defined by imaginary lines extended from two parallel outside lines of the second main overlay pattern.

20. (Original) The overlay key of claim 16, wherein the first auxiliary overlay pattern is formed at a location adjacent to a corner portion of the first overlay key.

21. (Original) The overlay key of claim 20, wherein a length of the first main overlay pattern is equal to a length of a corresponding side of the second main overlay pattern.

22. (Original) The overlay key of claim 21, wherein the first main overlay pattern is defined by imaginary lines extended from two parallel outside lines of the second main overlay pattern.

23. (Original) The overlay key of claim 1, wherein the first and second main overlay patterns are for measuring an overlay degree using an optical microscope, and the first and second auxiliary overlay patterns are for measuring an overlay degree using an in line SEM (scanning electron microscope).

24-50. (Canceled)

51. (Previously Presented) An overlay key, comprising:
a first overlay key on a first layer having a first main overlay pattern and a first auxiliary overlay pattern; and
a second overlay key on a second layer above the first layer, having a second main overlay pattern and a second auxiliary overlay pattern,
wherein, when viewed from above, at least some portion of the second auxiliary overlay pattern directly overlies at least some portion of the first auxiliary overlay pattern.

52. (Previously Presented) The overlay key of claim 51, wherein the first auxiliary overlay pattern includes a plurality of bar patterns spaced apart from each other.

53. (Previously Presented) The overlay key of claim 52, wherein the second auxiliary overlay pattern includes a plurality of hole patterns spaced apart from each other.

54. (Previously Presented) The overlay key of claim 53, wherein an interval between two adjacent bar patterns is larger than a width of the hole pattern.

55. (Previously Presented) The overlay key of claim 52, wherein the second auxiliary overlay pattern includes a plurality of second bar patterns having a smaller width than the bar patterns.

56. (Previously Presented) The overlay key of claim 51, wherein the first auxiliary overlay pattern includes a plurality of hole patterns.

57. (Previously Presented) The overlay key of claim 56, wherein the second auxiliary overlay pattern includes a plurality of bar patterns.

58. (Previously Presented) The overlay key of claim 57, wherein a width of the hole pattern of the first auxiliary overlay pattern is larger than a width of the bar pattern of the second auxiliary overlay pattern.